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Ovularia monilioides.—On reddish-brown, round spots, 1-4^{mm} in diameter; hyphæ fasciculate, hyaline, sparingly septate and often branched above, 35-50 × 3μ; conidia concatenate, 2-4 connected, obovate, hyaline, 12-17 × 9-12μ. On leaves of Myrica. Collected at Magnolia, Mass., June, 1884, by Miss C. H. Clarke.

Sphærella platani E. & M.—On round (2–4^{mm}) reddish-brown spots with a narrow dark but only slightly raised border. Perithecia epiphyllous, innate-erumpent (90-120μ); asci oblong 8-spored, 40-60 × 12-15μ, nearly sessile, sporidia subhyaline, ovate-oblong, 1-septate and constricted, nucleate, 14-16 × 4-6μ. Quite distinct from *S. platanifolia* Cke. On living leaves of *Platanus occidentalis*. On the same leaves, on similar spots, is a Phyllosticta which can hardly be distinguished from the Sphærella except by microscopical examination. Perithecia epiphyllous, black, about 100μ in diameter; spores oblong-elliptic, brownish, faintly nucleate, 5-6 x 2.5-3μ.—*J. B. Ellis, Newfield, N. J., and Dr. Geo. Martin.*

BOTANICAL NOTES.—The October number of *The Microscope* contains an article, by Mrs. L. R. Stowell, on the microscopic structure of *Hydrastis canadensis*, accompanied by two good plates.——Professor Trelease's paper in the Aug.-Sept. number of *Psyche*, Notes on the Relations of two Cecidomyans to Fungi, has a botanical as well as an entomological interest.——The last number (Oct.-Nov.) of the *Botanical Gazette* is devoted to the botanical aspect of the American Association for the Advancement of Science. Short abstracts are given of the more important papers read before the association and the Botanical Club. An account is given of the excursions of the club, and finally the whole is summed up in an editorial note upon the results of the Philadelphia meeting, in which, after pointing out the good results which the meeting accomplished, the editor properly criticises "the low average quality of the botanical papers presented before the association." In spite of the fact that the attendance included "some of the most distinguished names of the science in this country, the botanical communications in no instance exhibit that profound research or comprehensive statement of laws or relationships, or other characteristics that would entitle them to rank with the better papers presented by the zoölogists, physicists or chemists." We most heartily endorse the remark that "it lies with individual workers to see that this does not remain so."

ENTOMOLOGY.

C. EMERY ON THE FIRE-FLY OF ITALY.—Luciola is one of the Lampyrid beetles, differing from Lampyris chiefly by the head being less deeply sunk in the prothorax. Both male and female have wings and elytra, the male has only six abdominal segments against seven in the female; but the terminal segment of the male is large and bears indications of transverse division, as if it represented two somites.

Dr. C. Emery, of Bologna, was induced to examine this species (*Luciola italica* L.) by the publication of Wielowiejski's study of Lampyridæ in Zeitschrift f. Wissen. Zoologie, 1882. His own work was cut short by want of material, as last season was unfavorable in Italy; and it is only the preliminary views which he now publishes (same journal May, 1884). Some of these results are valuable.

He thinks that the female Luciola, though having wings, is unable to fly; though a friend alleged that he found both sexes flying *in copula.* The females are always very scarce, have two luminous spots on the ventral part of the abdomen (5th abdominal segment), whilst the males are common, and have the ventral parts of the 5th and 6th abdominal segments forming a large luminous organ. He is of opinion that in the imago state they never eat, and he finds the fore intestine filled with large air-sacs. [It might be well to compare this with the rectal air-sacs of larvæ of dragon-flies, and to see whether they may not be extensions of the tracheal system into the intestine, thus serving as lungs, and correlated with the great oxygen-consumption in the luminous organ].[1]

The abdomen contains the luminous organ in its ventral half, backed dorsally by a fat-body with concretions of uric acid. There are also fat masses in the prothorax, that of the male as well as its testes being rose-colored. The luminous organ is richly supplied with tracheæ, the larger tracheal trunks being *lined with bristles;* and the fine tracheal stems or branches run downwards through the luminous organ, perpendicularly towards the horizontal surface of the abdomen.

On a ventral view with weak magnifying the luminous organ is found to consist of bright round or oval areas, one of the perpendicular tracheal stems being in the center of each area, and between the bright areas are dark interspaces. The whole organ is constituted of vertical columns or cylinders, consisting of transparent tissue surrounding a tracheal stem and its branches, and the gaps between adjoining columns filled up by cellular "parenchymatous" matrix.

In a side view we can see the large tracheal trunk sending down the vertical stems, and marked not by spirals, but by transverse ridges. [This is one of the many incidental proofs coming up that the tracheal system has been misunderstood, that it is really the result of crenulations, and that there are no distinct spiral threads. Emery says: "I speak purposely of transverse ridges of chitin, and not, as is usually done, of a chitinous spiral, for such does not in fact exist here."]

By teasing the substance of the luminous plates we are able to follow the tracheal branchings. Each stem forming the axis of a column, divides racemosely into branches, and each branch bifurcates into a pair of capillaries whose walls are perfectly smooth.

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[1] The remarks in brackets are by the reviewer.

On the application of osmic acid to the abdomen of the living insect, death does not follow immediately, but the luminosity is continued for a time steadily. Long before the animal has ceased to move, the luminous plates begin to grow brown, the change proceeding from the anterior part, from the place where the tracheæ enter. The brown color becomes concentrated in round fields corresponding to the vertical columns, each surrounded by a circle of light.

The terminations of the vertical tracheal stems. are enclosed in cylindrical lobular masses, the columns of the luminous organ, the tracheæ sending out its racemose branches within each column; in macerated specimens (by osmic acid and thymol) dark masses are seen where the branches bifurcate to form the capillaries; the cells of which the columns consist exhibit no nuclei. [Judging from these figures it would seem as if the dark spots represented the nuclei: if this be the case every tracheal branch is in a cell and its place of bifurcation at the cell-nucleus.]

Emery finds no case of the anastomosing of the tracheal capillaries either of the same or of different stems; he is satisfied that no such anastomosing occurs in Luciola. His view is opposed to that of Kölliker and of Wielowiejski on Lampyris. [The conclusion of Wielowiejski appears to be without sufficient foundation; his figures show only a casual collection of a few of the intricately twining tubules.]

The cylindrical lobes or columns of the luminous organ are separated from each other by a granulated substance, and the tracheal capillaries extend to this and to the granulated parenchyme-cells, penetrating between the cells but not entering them.

The dorsal fat-layer was examined for the purpose of establishing homologies. It is white, has urate concretions swimming in the plasma of its cells, which are not distinctly limited by cell walls; but it has nuclei like those of the parenchyme of the luminous organ; and these facts as well as the tracheal arrangements favor the view that the luminous parenchyme is derived from the fat-body. It cannot be that the latter with its urate concretions is the result of combustion in the luminous organ, for the tracheal arrangements negative such a view.

In comparing Lampyris, Emery concludes that M. Schultze's tracheal end-cells are represented in Luciola by the bright cell-elements of the luminous cylinders enclosing the tracheal stems; that the tracheal branching is similar; also that the reactions are the same, osmium being precipitated so as to darken the substance in both cases. In Luciola there is a higher differentiation of parts.

Transversely striped tracheæ never enter the fat-masses of Luciola; it is only the smooth tracheal capillaries that pierce them, somewhat coarser than those of the luminous organ, and retaining air in their lumen. The fine branches here arise not in a racemose manner, but by a fascicle of two or more capillaries arising at a point, and running in complicated windings before they enter the fat masses. They were never seen to anastomose; the layer of matrix was very thin on the striped tracheæ, but much thicker on the capillaries. Sometimes the ends of the capillaries lying on a cell of the matrix were free; between two capillaries the matrix often formed a thin web, and rarely the matrix was gathered into a globule terminating the capillary. Real tracheal end-cells were not seen.

As to the physiology of the luminous organ, the seat of the luminosity is at the boundary between the tracheal cylinder and the parenchyme-matrix around it: this is the place where the capillaries begin and where the osmic acid is reduced by the illumination, where oxygen is consumed. [Here we have an additional argument for the doctrine that the oxygenation of the tissues depends not on a circulatory fluid around the tracheæ, but on the activity of the tracheal terminations.] The action of osmic acid at this part is an *experimentum crucis*, proving that at the bifurcation the plasma of the parenchyme coming to meet the fine tracheal capillaries, receives oxygen from them, and hence combustion arises where the chitin of the capillaries is very thin.

Emery holds that the use of the light-producing power is not merely for attracting the rare females, but for frightening such nocturnal enemies as bats. Luciola on being crushed emits an unpleasant flavor, but its taste is not at all bitter.—*G. Macloskie.*

ENTOMOLOGICAL NOTES.—A case of mimicry is noticed by C. M. Weed in the same number; *Tetracis lorata*, a white geometrid moth was found adhering to the stamens of a flower of the may-apple, its head toward the center, the wings being easily mistaken for the petals; a second one was found in exactly the same position.——E. L. Ragonot, 12 quai de la Rapee, Paris, is working out the Phycidæ and Galleridæ of the whole world, with a view of monographing these groups, and desires American specimens; European microlepidoptera will be sent in return.——At a recent meeting (July 2) of the London Entomological Society, Mr. C. O. Waterhouse exhibited various species of phytophagous beetles to show the extraordinary effect that exposure to light had produced on their colors. Fiery red had turned to bright green, pale yellow to brown, blue to black, and green to purple. The specimens exhibited had been in the public galleries of the Bristol Museum for twenty-five years.——In *Zoologischer Anzeiger*, July 7, P. Pancirtius publishes a note on the development of the wings in insects; in the same journal for July 21, E. Korschelt begins an account of his observations on the structure of the chorion and micropyle in the eggs of insects.——Professor A. S. Packard, Providence, R. I., desires alcoholic specimens of Poduridæ and other Thysanura with a view to a future monograph of this order. He will gladly name any specimens sent him for identification. ——Dr. Heylaerts publishes in the Compte-rendu de la Société entomologique de Belgique (p. CCVII), remarks on the Psychides of the United States. He believes that other genera of these sack-bearing caterpillars will be discovered, such as the Epichnopteryx, Bijugis and Fumea, though he adds that not an European species has yet been discovered here. He describes from Professor Riley's collection *Chalia rileyi*, and notices a series of seven cases of unknown species, all, except one from Brazil, being from the Southern and Western States and Territories.——An Asiatic species of Corydalus (*C. asiatica*) resembling in size and appearance our *C. cornutus*, is described and figured by J. Wood-Mason in the Proceedings of the Zoölogical Society of London (1884, p. 110). It occurred at the Naga hills, N. E. frontier of India. All the previously described species of this genus are American.

ZOÖLOGY.

THE DEEP SEA EXPLORATIONS OF THE "TALISMAN."—The official report by M. A. Milne-Edwards, of the last expedition of the *Talisman*, has been published and translated by the *Independent*. The expedition of 1883 was divided into several distinct steps, the aim being to examine: 1. The coast of Africa as far as Senegal, then the shores of the islands of Cape Verde, of the Canaries and Azores, and, finally, to examine the Sargasso sea and study its surface fauna as well as the nature of its depths.

In one of the first trials on the coast of Spain, the *Talisman* party found an accumulation of dead shells, having the aspect of the pliocene fossils of Sicily, and among which M. Fischer recognized *Cypridina islandica* and *Mya truncata*, which are common in boreal seas and do not live south of England. They were associated with some Mediterranean or pliocene shells. Off the coast of Morocco and the Sahara were found, at the depth of 500 to 600 meters, numerous fishes (Macrurus, Melanocephalus, Hoplostethus and Pleuronectes), crustaceans such as certain undescribed shrimps with an enormous rostrum, pointed like a sword, which was named Pandales; other shrimps of the genera Penæus, Pasiphaea, some small crabs (Etalia, Portunus and Oxyrhynchus), some red Holothurians, examples of the soft-shelled sea-urchin (Calveria), which formerly lived in the chalk formation; also many large-sized sponges, some in the shape of an enormous chapeau (Askonema), the others lamellated (Farrea), the others more or less globular.

Deeper down, toward 1000 and 1500 meters, fishes abounded;